REMARKS/ARGUMENTS

Applicant is hereby requesting continued examination of this application in accordance with the amendments and remarks contained herein below.

In the subject Office Action dated 12/13/2005, Claims 1-13 stand rejected under 35 U.S.C. 102(b) as being unpatentable over USPN 6,253,546 to Sun et al. (hereafter "Sun et al."). Applicant has amended claims 1, 3, 5, 6, 8, 9, 10, 12 and 13 to more distinctly claim the invention and distinguish the invention over Sun et al. Applicant has canceled claims 2, 7 and 11. In view of these amendments and the remarks that follow, Applicant hereby traverses the rejections of all claims under 35 U.S.C. 102(b).

Sun et al. discloses a control scheme for an internal combustion engine including a feedforward and a feedback controls. The Office Action equates torque equation (1) with the base desired engine torque of Applicant's claims. The feedforward control of Sun et al. is based upon movement of the throttle in accordance with a pre-determined trajectory from which intake manifold pressure trajectory is determined. This manifold pressure trajectory and throttle trajectory are then used to schedule throttle, spark timing and fueling rate in accordance with the multi-variable torque equation (1). Sun et al. therefore teach a feedforward control of throttle, spark and fuel during transitions from stratified mode to a LNT purge mode. Multi-variable torque equation (1) of Sun et al. requires continual adjustment of individual engine parameters (e.g. spark and fuel) during transition in accordance with the manifold pressure and throttle trajectories.

Claim 1 is set forth below as representative of Applicant's invention.

> 1. Method for controlling a direct-injection gasoline engine during regeneration of a lean NOx trap disposed in an exhaust path of the engine, the regeneration characterized by a transition from stratified lean engine operation to homogeneous rich engine operation, comprising:
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> determining a base desired torque;
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> estimating engine torque discontinuity between stratified lean engine operation and homogeneous rich engine operation based on stratified lean engine operation intake gas charges and homogeneous rich engine operation intake gas charges; and

applying a feed-forward compensating torque to the base desired torque during lean NOx trap regeneration in an amount sufficient to compensate for the estimated engine torque discontinuity.

In contradistinction to the teaching of Sun et al., Applicant's invention as exemplified above requires the estimation of the torque discontinuity between stratified lean engine operation and homogeneous rich engine operation. Sun et al. teaches a substantially continuous trajectory of throttle and manifold pressure. Furthermore, the torque discontinuity of Applicant's invention is based on intake gas charges during two distinct and substantially discontinuous engine operations – i.e. stratified lean and homogeneous rich. Sun et al. on the other hand teaches reliance upon trajectories or substantially continuous paths from a stratified mode to a LNT purge mode. Furthermore, Applicant's invention requires application of a feed-forward compensating torque to the base desired torque which calculation or determination is not dependent upon or directly reliant upon the losses to which the feed-forward compensating torque is addressed. The base desired torque of Applicant's invention is not recalculated during any transition between stratified lean and homogeneous rich in the manner taught by Sun et al. which incorporates the pumping losses and mechanical rubbing friction losses losses (f(N,P) of equation (1)) directly in the continuous recalculation of fueling and spark necessary to balance the torque equation (1). Simply, the torque equation (1) of Sun et al. does not operate in the manner of the determined base desired torque of Applicant's invention.

Applicant also wishes to direct attention to paragraph [0007] of the specification which discusses in general some of the deficiencies in the art shared by Sun et al. to which Applicant's invention is directed toward addressing. In Sun et al., the integration of at least spark and fuel control within the continuous torque determination of equation (1) may result in such deficiencies. Applicant's invention on the other hand enables the maintenance of the base desired torque and simply and elegantly applies a feed-forward compensating torque thereto during lean NOx trap regeneration. Removal of such compensating torque upon return to lean

stratified operation is likewise simple as exemplified for example in Applicant's claim 5.

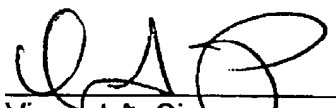
Applicant has provided the amendments and the arguments herein in a good faith effort to adequately distinguish the invention over Sun et al. The arguments specifically provided herein with respect to independent claim 1 apply with equal reasoning to independent claims 6 and 10 and to all claims depending from claims 1, 6 and 10.

Therefore, Applicant respectfully submits that all pending claims are adequately patentably distinguished over Sun et al. and that same are in condition for allowance thereover. Applicant respectfully requests that all pending claims 1, 3, 4, 5, 6, 8, 9, 10, 12 and 13 be allowed to proceed to issue.

If the Examiner has any questions regarding the contents of the present response he may contact Applicant's attorney at the phone number appearing below.

Any fees associated with this response may be charged to General Motors Deposit Account No. 07-0960.

Respectfully submitted,



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